

## An Evaluation of the Vermont Worksite Smoking Law

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### Synopsis .....

*In view of the fact that the impact of statewide smoking laws on private worksite policies and the smoking behavior of employees has not been evaluated, two cross-sectional surveys were performed in Vermont to measure compliance with such a law: a random-digit telephone survey of employees and a subsequent mail survey of their employers. Em-*

*ployers were not aware that one of their employees had been surveyed.*

*Roughly half (56 percent) of the employees and 66.5 percent of their employers described policies that are in compliance. Among all employers who described policies in compliance with the law, 68.1 percent of their employees also described compliant policies. Among all employees who described non-compliant policies, 48.8 percent had employers who described compliant policies. Overall, employees and employers agreed on how their policies stood with respect to compliance in 67.6 percent of cases.*

*The prevalence and amount of smoking at work declined after the institution of the law but so did the prevalence and amount of smoking at home. Changes toward more restrictive policies were associated with reductions in cigarette consumption at work, but not with quitting. The study suggests that a large fraction of worksite smoking policies may not comply with a statewide worksite smoking law. The proportion of companies complying with such a law may be overestimated if information on compliance is obtained only from employers.*

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By December 1990, 18 States had legislation limiting smoking at private worksites (1). The impact of statewide legislation on worksite smoking policies and the smoking behavior of workers has not been evaluated. A 3-month followup of a 1987 ordinance in Cambridge, MA, restricting smoking in worksites found poor compliance with the law and no change in smoking prevalence according to self-report (2). A 1-year followup of a similar San Francisco ordinance focused on the ease of implementing the law and did not report information on changes in policies or behavior (3). Surveys of employees of large organizations affected by changes in worksite smoking policies have generally found declines in the amount of smoking reported by employees after implementation of more restrictive policies (4-8).

In this study, we attempted to measure compliance with such legislation and the relationship between policy change and employee smoking behavior in a statewide sample of all employed people.

Vermont's worksite smoking law went into effect on July 1, 1988. The law requires that all employers establish a policy that prohibits smoking throughout the workplace or restricts smoking to designated enclosed smoking areas where nonsmoking employees are not required to visit on a regular basis. Smoking is permitted in unenclosed areas only if 75 percent of the employees vote for it and only if such smoking will not be a cause of physical irritation to any nonsmoking employee.

### Methodology

The study consisted of two cross-sectional surveys: a random-digit telephone survey of a sample of Vermont employees and a mail survey sent to their employers. The telephone survey was conducted in November 1989. At least five attempts were made to reach each household. Calls were made during day, evening, and weekend hours. Respondents were selected randomly from all house-

hold residents older than age 18 who worked outside the home at a Vermont business. The self-employed were not eligible. The questions in the mail survey to employers, sent in December 1989, were identical to those in the telephone survey.

The analysis was weighted to adjust for the underrepresentation of employees in households with multiple eligible respondents. The employee was treated as the unit of observation, and the employee and employer responses were paired for some of the analysis.

## Results

We began with 2,070 randomly selected telephone numbers. Of these, 1,075 were excluded as nonworking, nonresidential, or non-answering. Someone was reached at the remaining 995 residences, but 240 respondents refused before their eligibility could be determined. Among the 755 remaining, 462 (61.2 percent) were found eligible for the survey. Of these, 407 (88.1 percent) completed the interview. The response rate was 66.8 percent of the sum of those found eligible and those likely to have been eligible if their eligibility could have been determined.

The employers of 279 (68.6 percent) of the 407 employees responded. However, 61.9 percent of the nonresponses were a result of invalid addresses. Among employers who actually received a mailed questionnaire, the response rate was 86.5 percent.

Table 1 shows the types of smoking policies in 1989 (post-law) reported by the total sample of employees. Among all 404 employees who knew the type of policy in effect at their workplace, 216 (53.2 percent) reported restrictive policies that totally banned smoking or limited smoking to enclosed spaces.

When the type of worksite smoking policy reported by the employees was compared with that reported independently by their employers (279 pairs), the two were in agreement regarding compliance with the law in 67.6 percent of the cases (table 2). Significantly, more employers (66.5 percent) than employees (56 percent) reported policies in compliance, that is to say, smoking was either prohibited or allowed only in enclosed areas in their workplace (McNemar's test,  $P = 0.0004$ ). Among all employers who described policies in compliance with the law, 68.1 percent (126 of 185) of their employees also described policies in compliance. Among all employees who described policies not in compliance, 48.8 percent (59 of 121) had employers who described policies in compliance.

Table 1. Types of worksite smoking policies reported by employees, Vermont, 1989

Type of policy	Number	Percent
<i>Not in compliance with the law</i>		
Smoke anywhere.....	100	24.6
Smoke anywhere but in certain areas.....	12	3.0
Smoke only in certain unenclosed areas....	76	18.6
<i>In compliance with the law</i>		
Smoke only in enclosed areas.....	130	32.0
No smoking anywhere.....	86	21.2
Unknown.....	3	0.7
Total.....	407	100.0

Table 2. Concordance of employee and employer pairs with respect to the reported compliance of smoking policy with the law, Vermont, 1989

Employee responses on compliance	Employer responses on compliance		
	Yes	No	Total
Yes.....	126	31	157
No.....	59	62	121
Total.....	185	93	278

Among all employees surveyed, the reported prevalence of smoking at work had declined in the 16 months since the law took effect from 27 percent to 22 percent (McNemar's test,  $P = 0.001$ ). Among those smoking both pre-law and post-law, the mean number of cigarettes smoked at work was 11.3 pre-law and 7.8 post-law (Wilcoxon signed ranks test,  $P < 0.0001$ ). The reported prevalence of smoking at home declined from 29.9 percent to 24.9 percent over the same interval (McNemar's test,  $P = 0.0003$ ). The mean number of cigarettes smoked at home was 14.2 pre-law and 11.0 post-law ( $P = 0.0002$ ). Among all employees, 32.1 percent reported that their worksites had established enclosed smoking areas or prohibited smoking entirely since the passage of the law. Smoking employees reporting either of these policy changes were compared with smoking employees reporting no such policy changes (table 3). Quit rates did not differ significantly between the two groups at home or at work. Among all smoking employees, however, 56.8 percent reported smoking less at work where policies had changed, compared with 35 percent of those working at sites with unchanged policies. The opposite relationship was observed for those smoking at home, where only 20.3 percent reported smoking less compared with 38.9 percent of those with unchanged policies.

Table 3. Behavior changes at work and at home among smoking employees related to introduction of more restrictive worksite smoking policies, Vermont, 1989

Behavior change	Worksite policy changes				P value <sup>1</sup>
	No more restrictive		More restrictive		
	Number	Percent	Number	Percent	
<b>At work:</b>					
Quit.....	13	23.1	7	17.1	0.48
Smoking less ....	21	35.0	21	56.8	0.03
<b>At home:</b>					
Quit.....	13	19.0	5	11.4	0.29
Smoking less ....	26	38.9	8	20.3	0.05

<sup>1</sup> By chi-square test.

## Discussion

This study is the first attempt to measure compliance with a recent statewide worksite smoking law from the responses of a sample of employed people and their employers. The study's major weakness is that its participants may not be representative of all Vermont employees, given the relatively low response rate (66.8 percent) in the employee survey.

The results suggest that, by either employee or employer report, only a portion of Vermont's employees work for employers who are in compliance with the worksite smoking law. Employers were more likely to characterize their policies as compliant than were employees. The frequency with which employees and their employers characterized their smoking policies differently may reflect an inaccurate assessment among employers of the level of compliance with their policies, a difference between employers and employees in terms of how they interpret their policies, or a lack of awareness among employees of the smoking restrictions at their workplace.

The study indicates that smoking policies in Vermont worksites have become more restrictive since the passage of the State's worksite smoking law. This change is consistent with the trend nationwide (9,10), but we could not determine what proportion of the change was due to the institution of the law.

Both the number of smokers and the number of cigarettes smoked daily at work declined dramatically over the 16-month study interval. It is not clear that the worksite smoking law deserves the credit for these changes, however, since the prevalence and amount of smoking at home declined just as sharply over the same period. Some or all of the decline may have been due to the downward trend in smoking prevalence nationwide (11).

The analysis of workplaces with changes toward more restrictive policies versus workplaces with no such changes (table 3) was conducted to determine whether the reported policy tightening and the reductions in employee smoking were associated with one another. Policy tightening was not associated with quitting smoking. Policy tightening was associated, however, with cutting down at work and being less likely to cut down at home. Similar results have been reported in some studies of new policies in single institutions (5,6), but not in all (7). A statewide worksite smoking law, therefore, may be able to reduce cigarette consumption and environmental tobacco smoke on the job, but its effect on total daily cigarette consumption by employees may be minimal.

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